

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the current application.

LISTING OF THE CLAIMS

1. (Cancelled).

2. (Currently Amended) The solid-state imaging apparatus ~~light-collecting device~~ according to claim 9 ~~Claim 1~~,

wherein incident light is collected in a center of a plane made of said plurality of light-transmitting films, the incident light being incident at an angle asymmetrical to a ~~the~~ center of a ~~the~~ plane made of said plurality of light-transmitting films.

3. (Currently Amended) The solid-state imaging apparatus ~~light-collecting device~~ according to claim 9 ~~Claim 1~~,

wherein an amount of phase change of the incident light,  $\phi(x)$ , ~~depends~~ ~~depending~~ on a distance  $x$  in an in-plane direction and approximately satisfies the following equation,

$$\phi(x) = Ax^2 + Bx \sin \theta + 2m\pi$$

wherein ~~where~~  $\theta$  is an incident angle of the incident light,  $A$  and  $B$  are predetermined constants, and  $m$  is a natural number.

4. (Currently Amended) The solid-state imaging apparatus ~~light-collecting device~~ according to claim 9 ~~Claim 1~~,

wherein

$$\Delta n(x) = \Delta n_{\max} [\phi(x)/2\pi + C]$$

is satisfied, where  $\Delta n_{\max}$  is a difference of refractive indices indexes between one of said plurality of light-transmitting films and a light-incoming side medium,  $\Delta n(x)$  is a difference of refractive indices indexes between another one of said plurality of light-transmitting films and the light-incoming side medium at a position  $x$ , and  $C$  is a constant.

5. (Currently Amended) The solid-state imaging apparatus light-collecting device according to claim 9 Claim 1,

wherein heights of said plurality light-transmitting films are constant in a direction normal to said plurality of light-transmitting films.

6. (Currently Amended) The solid-state imaging apparatus light-collecting device according to claim 9 Claim 1,

wherein each of said plurality of light-transmitting films includes one of  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{Nb}_2\text{O}_5$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{Si}_3\text{N}_4$  and  $\text{Si}_2\text{N}_3$ .

7. (Currently Amended) The solid-state imaging apparatus light-collecting device according to claim 9 Claim 1,

wherein each of said plurality of light-transmitting films includes one of  $\text{SiO}_2$  doped with B or P, that is Boro-Phospho Silicated Glass, and Teraethoxy Silane.

8. (Currently Amended) The solid-state imaging apparatus light-collecting device according to claim 9 Claim 1,

wherein each of said plurality of light-transmitting films includes one of benzocyclobutene, polymethymethacrylate, polyamide and polyimide.

9. (Currently Amended) A solid-state imaging apparatus comprising arranged unit pixels, each of which includes a light-collector ~~respective light-collecting device~~ and a light-receiver,

wherein said light-collector ~~light-collecting device~~ comprises:

a substrate into which ~~the~~ incident light is incident; and

above said substrate, a plurality of light-transmitting films are formed in a region into which the incident light is incident,

wherein a said light-transmitting film of said plurality of light-transmitting films forms zones, a zone in which a width of each zone is equal to or shorter than a wavelength of the incident light,

wherein each zone shares a center point which is located at a position displaced from a the center of said light-receiver device, and

~~the plurality of~~ said plurality of light-transmitting films form an effective refractive index distribution,

wherein, in a unit pixel, among said unit pixels, which is located at a center of a plane on which said unit pixels are formed, a position at which an effective refractive distribution of a corresponding light-collector is a maximum value matches a central axis of a corresponding light-receiver, and

wherein in a unit pixel, among said unit pixels, which is located at a periphery of the plane, a position at which the effective refractive distribution of a corresponding light-collector is a maximum value is displaced from the central axis of a corresponding light-receiver toward the

center of the plane.

10. (Currently Amended) The solid-state imaging apparatus according to claim Claim 9,  
wherein an off-centered light-transmitting film is ~~also~~ formed in an area shared by one  
light-collector light-collecting device and another light-collector light-collecting device in an  
adjacent unit pixel.

11. (Currently Amended) The solid-state imaging apparatus according to claim Claim 9, at least  
comprising:

a first unit pixel for a first color light out of the incident light; and

a second unit pixel for a second color light which has a typical wavelength that is  
different from a typical wavelength of the first color light;

wherein said first unit pixel includes a first light-collector light-collecting device, and

said second unit pixel includes a second light-collector, light-collecting device in which a  
focal length of the second color light is equal to a focal length of the first color light in said first  
light-collector light-collecting devices.

12. (Currently Amended) The solid-state imaging apparatus according to claim Claim 9,

wherein a focal point is set at a predetermined position by controlling an effective a  
refractive index distribution of said light-transmitting film.

13. (Currently Amended) The solid-state imaging apparatus according to claim Claim 9,

wherein each of said unit pixels further includes a light-collecting lens on a light-

outgoing side of said light-collector ~~light-collecting device~~.

14. (Currently Amended) The solid-state imaging apparatus according to claim ~~Claim~~ 9,  
wherein an effective a refractive index distribution of said light-transmitting film is  
different between light-collectors ~~light-collecting devices~~ of said unit pixels located at the in-a  
center of said a-plane on which said unit pixels are formed and light-collectors ~~light-collecting~~  
~~devices~~ of said unit pixels located at in-the periphery of the plane.

15. (Cancelled).